

**LENGTH-WEIGHT RELATION
IN THE COMMON OR WHITE SHRIMP
*PENAEUS SETIFERUS***



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United States Department of the Interior, Fred A. Seaton, Secretary
Fish and Wildlife Service, Arnie J. Suomela, Commissioner

LENGTH-WEIGHT RELATION IN THE COMMON OR WHITE
SHRIMP, PENAEUS SETIFERUS

by

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LENGTH-WEIGHT RELATION IN THE COMMON OR WHITE

SHRIMP, PENAEUS SETIFERUS

In order to determine the size at which a species can be most profitably taken, the relation between increase in mass weight of a shrimp population through growth and recruitment and decrease through mortality must be known. Information about length and weight as attributes of growth are essential in understanding this relation. The length-weight relations for common or white shrimp, Penaeus setiferus (Linnaeus), were determined from measurements of lengths and weights of 14,284 specimens secured over a 1-year period in Texas. Material was obtained during each month of the year. Measurements of total length (from tip of rostrum to tip of telson) were taken to the nearest millimeter and weights to the nearest tenth of a gram. Table 1 presents the monthly length-weight distributions showing separately for males and females the number of specimens examined in each 5-mm. length interval and the average weight in grams.

Some differences in the length-weight relation occur seasonally owing primarily to changes in the body proportions of the shrimp. The bodies of the older shrimp tend to thicken, and their weights are greater in proportion to length than are those of younger shrimp. This change appears to be associated with maturity and was most noticeable during July and August when both mature shrimp, about 1 year old, and immature young-of-the-year were present in the catches in appreciable numbers. The differences in weight for mature and immature shrimp of the same length are shown in table 2 and figure 1. Where the two length ranges overlap (148 to 163 mm.) it is readily apparent that the mature shrimp

average considerably heavier (about 3 grams) than immature shrimp of the same length.

In figure 1 we have also plotted the length-weight relation of all shrimp over 100 mm. total length taken during the period of September through March (table 3). These shrimp were largely immature. The length-weight relation for these shrimp from September to March was identical with that of the immature for July-August over the overlapping size ranges (103 to 163 mm.). In shrimp over 170 mm. total length the difference between the upper and lower curves decreases, and it disappears entirely between about 180 and 190 mm. We interpret this to mean that all shrimp over 190 mm. total length were mature and that between 170 and 190 mm. there were increasing proportions of mature or maturing shrimp.

The general practice in the shrimp industry is to refer to the size of shrimp in terms of the number required to make 1 pound. Two systems are in use--the number of whole shrimp per pound and the number of shrimp tails per pound. The latter is more generally used. Since the original measurements were made for whole shrimp, the factor 1.68 has been applied to the number of whole shrimp per pound to obtain the approximate number of tails per pound. These data are presented in table 4 and in figure 2 and 3. Most of the commercial catch of white shrimp is composed of shrimp between 3 and 8 inches in total length.

Kenneth H. Mosher contributed much in the collection of data which made this study possible.

Table 1.--Seasonal length-weight distribution for Texas shrimp
(weights in grams)

| Midpoint of length interval (mm.) | January | | | | February | | | |
|---|-------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|
| | Males | | Females | | Males | | Females | |
| | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight |
| 18 | | | | | | | | |
| 23 | | | | | | | | |
| 28 | | | | | | | | |
| 33 | | | | | | | | |
| 38 | | | | | | | | |
| 43 | | | | | | | | |
| 48 | | | | | | | | |
| 53 | | | | | | | | |
| 58 | | | | | | | | |
| 63 | | | | | | | | |
| 68 | | | | | | | | |
| 73 | | | | | | | | |
| 78 | 1 | 3.00 | | | | | | |
| 83 | 2 | 4.00 | 2 | 4.00 | | | | |
| 88 | | | 4 | 5.00 | 1 | 5.00 | | |
| 93 | 7 | 5.29 | 7 | 5.71 | 1 | 5.00 | | |
| 98 | 17 | 6.71 | 11 | 6.55 | | | | |
| 103 | 24 | 7.71 | 24 | 7.46 | 1 | 8.00 | | |
| 108 | 26 | 8.58 | 32 | 8.53 | 4 | 9.50 | 3 | 9.00 |
| 113 | 22 | 10.09 | 32 | 9.97 | 8 | 10.75 | 6 | 11.17 |
| 118 | 13 | 12.54 | 23 | 11.87 | 12 | 12.50 | 11 | 12.82 |
| 123 | 26 | 14.15 | 20 | 14.20 | 28 | 14.71 | 29 | 14.31 |
| 128 | 39 | 15.77 | 28 | 15.89 | 46 | 16.41 | 52 | 16.08 |
| 133 | 19 | 18.21 | 23 | 17.87 | 71 | 17.89 | 71 | 17.86 |
| 138 | 16 | 19.88 | 18 | 19.67 | 61 | 20.03 | 69 | 19.87 |
| 143 | 12 | 22.00 | 9 | 22.44 | 60 | 22.70 | 58 | 22.28 |
| 148 | 5 | 25.00 | 5 | 25.60 | 56 | 25.38 | 51 | 25.06 |
| 153 | 3 | 29.00 | 1 | 26.00 | 37 | 28.43 | 28 | 28.18 |
| 158 | 7 | 31.43 | 3 | 33.33 | 38 | 31.11 | 28 | 31.29 |
| 163 | 4 | 34.00 | 4 | 35.25 | 25 | 34.20 | 15 | 34.53 |
| 168 | 3 | 38.00 | 3 | 39.67 | 5 | 39.20 | 17 | 37.82 |
| 173 | | | 3 | 40.67 | 1 | 44.00 | 3 | 40.00 |
| 178 | | | 1 | 47.00 | 2 | 44.50 | 1 | 55.00 |
| 183 | | | 1 | 46.00 | | | 1 | 55.00 |
| Total | 246 | | 254 | | 457 | | 443 | |

Table 1.--Seasonal length-weight distribution for Texas shrimp, cont'd

| Midpoint of length interval (mm.) | March | | | | April | | | |
|---|-------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|
| | Males | | Females | | Males | | Females | |
| | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight |
| 18 | | | | | | | | |
| 23 | | | | | | | | |
| 28 | | | | | | | | |
| 33 | | | | | | | | |
| 38 | | | | | | | | |
| 43 | | | | | | | | |
| 48 | | | | | | | | |
| 53 | | | | | | | | |
| 58 | | | | | | | | |
| 63 | | | | | | | | |
| 68 | | | | | | | | |
| 73 | | | | | | | | |
| 78 | | | | | | | | |
| 83 | | | | | | | | |
| 88 | 1 | 5.00 | | | | | | |
| 93 | | | | | | | | |
| 98 | 1 | 7.00 | 1 | 8.00 | | | 1 | 9.00 |
| 103 | | | 1 | 8.00 | | | | |
| 108 | | | 1 | 9.00 | | | 2 | 9.50 |
| 113 | 13 | 10.23 | 5 | 10.80 | 1 | 11.00 | 2 | 11.00 |
| 118 | 5 | 12.80 | 9 | 12.22 | 1 | 13.00 | 14 | 13.71 |
| 123 | 12 | 14.00 | 16 | 13.56 | 9 | 15.22 | 18 | 15.28 |
| 128 | 16 | 15.75 | 6 | 15.50 | 58 | 17.09 | 28 | 17.21 |
| 133 | 5 | 17.40 | 6 | 17.33 | 93 | 18.98 | 67 | 18.67 |
| 138 | 7 | 20.29 | 4 | 19.50 | 135 | 20.92 | 90 | 20.90 |
| 143 | 6 | 22.33 | 2 | 22.50 | 113 | 23.50 | 97 | 23.74 |
| 148 | 6 | 26.00 | 3 | 24.67 | 75 | 26.37 | 104 | 26.12 |
| 153 | 4 | 28.75 | 6 | 28.83 | 36 | 29.42 | 68 | 29.01 |
| 158 | 39 | 32.74 | 11 | 31.82 | 30 | 32.20 | 52 | 32.02 |
| 163 | 24 | 35.04 | 18 | 35.89 | 16 | 35.38 | 27 | 35.48 |
| 168 | 18 | 38.39 | 28 | 37.75 | 11 | 39.00 | 23 | 39.17 |
| 173 | 3 | 41.33 | 13 | 42.46 | 4 | 44.50 | 15 | 42.67 |
| 178 | | | 6 | 46.17 | 1 | 49.00 | 3 | 48.33 |
| 183 | | | 2 | 49.00 | | | 2 | 53.00 |
| 188 | | | 1 | 50.00 | | | | |
| Total | 160 | | 139 | | 583 | | 613 | |

Table 1.--Seasonal length-weight distribution for Texas shrimp, cont'd

| Midpoint of length interval (mm.) | May | | | | June | | | |
|---|-------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|
| | Males | | Females | | Males | | Females | |
| | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight |
| 18 | | | | | | | 1 | 0.10 |
| 23 | | | | | | | 8 | 0.11 |
| 28 | | | | | | | 11 | 0.19 |
| 33 | | | | | 2 | 0.3 | 18 | 0.30 |
| 38 | | | | | 2 | 0.6 | 18 | 0.49 |
| 43 | | | | | 2 | 0.7 | 2 | 0.65 |
| 48 | | | | | 1 | 0.9 | 2 | 0.90 |
| 53 | | | | | 2 | 1.0 | 3 | 0.97 |
| 58 | | | | | | | 1 | 1.20 |
| 63 | | | | | | | | |
| 68 | | | | | | | | |
| 73 | | | | | | | | |
| 78 | | | | | | | | |
| 83 | | | | | | | | |
| 88 | | | | | | | | |
| 93 | | | | | | | | |
| 98 | | | | | | | | |
| 103 | | | | | | | | |
| 108 | | | | | | | | |
| 113 | 1 | 12.00 | 1 | 11.00 | | | | |
| 118 | | | 2 | 12.50 | | | | |
| 123 | 2 | 16.00 | | | | | | |
| 128 | 3 | 15.67 | 3 | 18.00 | | | | |
| 133 | 4 | 19.50 | 3 | 19.00 | | | | |
| 138 | 27 | 21.81 | 7 | 21.29 | 1 | 24.00 | | |
| 143 | 45 | 24.38 | 19 | 24.32 | 4 | 25.75 | | |
| 148 | 115 | 27.37 | 51 | 27.10 | 42 | 28.33 | 4 | 27.00 |
| 153 | 246 | 29.76 | 101 | 29.51 | 98 | 31.01 | 14 | 30.07 |
| 158 | 239 | 32.50 | 144 | 32.08 | 151 | 34.12 | 46 | 33.30 |
| 163 | 130 | 35.37 | 164 | 36.01 | 136 | 37.09 | 76 | 36.83 |
| 168 | 48 | 38.44 | 203 | 38.93 | 79 | 40.25 | 109 | 39.95 |
| 173 | 18 | 41.83 | 146 | 42.79 | 14 | 45.21 | 129 | 44.16 |
| 178 | 4 | 44.50 | 50 | 46.84 | 2 | 48.50 | 79 | 48.27 |
| 183 | | | 15 | 50.27 | | | 44 | 52.70 |
| 188 | | | 2 | 54.50 | | | 10 | 58.00 |
| 193 | | | 2 | 59.50 | | | 3 | 60.33 |
| 198 | | | 1 | 70.00 | | | | |
| Total | 882 | | 914 | | 536 | | 578 | |

Table 1.--Seasonal length-weight distribution for Texas shrimp, cont'd

| Midpoint of length interval (mm.) | July | | | | August | | | |
|---|-------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|
| | Males | | Females | | Males | | Females | |
| | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight |
| 18 | | | 8 | 0.10 | | | | |
| 23 | | | 14 | 0.10 | | | 1 | 0.10 |
| 28 | | | 14 | 0.15 | | | 6 | 0.23 |
| 33 | | | 16 | 0.30 | 2 | 0.50 | 5 | 0.36 |
| 38 | | | 19 | 0.51 | 1 | 0.60 | 7 | 0.47 |
| 43 | 1 | 0.6 | 11 | 0.64 | | | 3 | 0.97 |
| 48 | | | 22 | 0.86 | 1 | 1.00 | 3 | 1.00 |
| 53 | 5 | 1.30 | 16 | 1.21 | 1 | 1.40 | | |
| 58 | 3 | 1.53 | 9 | 1.66 | | | 1 | 2.00 |
| 63 | 1 | 1.80 | 4 | 2.03 | | | | |
| 68 | 1 | 2.50 | 5 | 2.50 | | | | |
| 73 | 1 | 3.00 | 2 | 3.00 | | | | |
| 78 | 5 | 3.84 | 7 | 3.89 | | | | |
| 83 | 5 | 4.34 | 4 | 4.93 | | | 2 | 5.00 |
| 88 | 3 | 5.50 | 6 | 5.47 | | | 2 | 4.50 |
| 93 | 5 | 6.80 | 8 | 6.00 | 2 | 5.50 | 8 | 6.00 |
| 98 | 12 | 7.08 | 5 | 7.20 | 9 | 7.44 | 9 | 7.22 |
| 103 | 14 | 8.14 | 15 | 8.07 | 20 | 8.15 | 16 | 8.19 |
| 108 | 10 | 9.30 | 13 | 9.08 | 14 | 9.14 | 19 | 8.95 |
| 113 | 14 | 11.00 | 9 | 10.67 | 31 | 10.94 | 27 | 10.52 |
| 118 | 12 | 12.42 | 12 | 12.83 | 27 | 12.19 | 38 | 12.13 |
| 123 | 8 | 13.75 | 3 | 15.00 | 47 | 13.55 | 49 | 13.78 |
| 128 | 12 | 16.17 | 5 | 15.20 | 63 | 15.59 | 55 | 15.60 |
| 133 | 6 | 18.17 | 6 | 17.67 | 77 | 17.75 | 52 | 17.75 |
| 138 | 4 | 20.50 | 5 | 20.00 | 95 | 19.69 | 90 | 19.57 |
| 143 | 4 | 23.50 | 6 | 23.00 | 64 | 22.22 | 71 | 22.10 |
| 148 | 5 | 27.20 | 7 | 26.57 | 50 | 24.74 | 37 | 25.24 |
| 153 | 32 | 31.09 | 10 | 29.70 | 32 | 27.50 | 37 | 27.30 |
| 158 | 121 | 34.45 | 19 | 33.32 | 24 | 34.63 | 20 | 31.20 |
| 163 | 171 | 37.32 | 53 | 37.23 | 42 | 38.38 | 14 | 34.57 |
| 168 | 72 | 40.64 | 98 | 40.61 | 28 | 42.07 | 23 | 41.04 |
| 173 | 24 | 43.67 | 86 | 44.76 | 8 | 46.00 | 33 | 45.18 |
| 178 | 5 | 48.00 | 54 | 48.28 | 3 | 48.00 | 32 | 49.41 |
| 183 | | | 32 | 52.63 | | | 14 | 53.64 |
| 188 | | | 8 | 56.75 | | | 11 | 56.91 |
| 193 | | | 2 | 59.00 | | | 1 | 62.00 |
| 198 | | | 2 | 70.00 | | | | |
| Total | 556 | | 615 | | 641 | | 686 | |

Table 1.--Seasonal length-weight distribution for Texas shrimp, cont'd

| Midpoint of length interval (mm.) | September | | | | October | | | |
|---|-------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|
| | Males | | Females | | Males | | Females | |
| | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight |
| 18 | | | | | | | | |
| 23 | | | | | | | | |
| 28 | | | | | | | | |
| 33 | | | | | | | | |
| 38 | | | | | | | | |
| 43 | | | | | | | | |
| 48 | | | | | | | 1 | 1.00 |
| 53 | | | | | | | | |
| 58 | 1 | 2.00 | 3 | 1.33 | | | 1 | 1.00 |
| 63 | | | | | | | 1 | 2.00 |
| 68 | 2 | 2.50 | | | | | 1 | 3.00 |
| 73 | 1 | 3.00 | 2 | 3.00 | 1 | 3.14 | 2 | 3.00 |
| 78 | 1 | 3.00 | 5 | 3.40 | 5 | 2.60 | | |
| 83 | 3 | 4.33 | 3 | 4.33 | 2 | 4.50 | 6 | 3.67 |
| 88 | 4 | 5.00 | 6 | 5.00 | 3 | 5.00 | 8 | 5.00 |
| 93 | 8 | 5.75 | 12 | 6.00 | 5 | 5.80 | 8 | 6.50 |
| 98 | 18 | 7.06 | 13 | 6.92 | 3 | 7.00 | 4 | 7.25 |
| 103 | 33 | 7.91 | 31 | 7.90 | 14 | 8.07 | 7 | 7.86 |
| 108 | 50 | 9.26 | 42 | 9.24 | 28 | 9.64 | 17 | 9.00 |
| 113 | 89 | 11.00 | 58 | 10.76 | 36 | 10.69 | 29 | 10.62 |
| 118 | 92 | 12.25 | 76 | 12.08 | 53 | 11.92 | 42 | 11.83 |
| 123 | 100 | 13.92 | 92 | 13.68 | 76 | 13.92 | 62 | 13.89 |
| 128 | 86 | 15.81 | 74 | 15.73 | 96 | 15.84 | 83 | 15.81 |
| 133 | 72 | 18.00 | 79 | 17.75 | 110 | 17.82 | 115 | 17.60 |
| 138 | 77 | 19.90 | 76 | 19.93 | 107 | 19.53 | 104 | 19.77 |
| 143 | 68 | 22.43 | 47 | 22.40 | 75 | 22.19 | 102 | 22.18 |
| 148 | 73 | 25.34 | 50 | 25.18 | 50 | 24.90 | 62 | 24.97 |
| 153 | 38 | 27.37 | 44 | 27.61 | 21 | 28.43 | 42 | 28.12 |
| 158 | 10 | 30.90 | 21 | 30.81 | 14 | 32.71 | 37 | 31.46 |
| 163 | 7 | 33.57 | 16 | 34.50 | 8 | 35.50 | 9 | 34.56 |
| 168 | 2 | 36.00 | 5 | 37.80 | 7 | 39.86 | 17 | 37.71 |
| 173 | | | 4 | 41.50 | 3 | 43.33 | 6 | 49.17 |
| 178 | | | 3 | 47.00 | | | 7 | 50.57 |
| 183 | | | 1 | 50.00 | | | 4 | 50.25 |
| Total | 835 | | 763 | | 717 | | 777 | |

Table 1.--Seasonal length-weight distribution for Texas shrimp, cont'd

| Midpoint of length interval (mm.) | November | | | | December | | | |
|---|-------------|-------------------|-------------|-------------------|-------------|-------------------|-------------|-------------------|
| | Males | | Females | | Males | | Females | |
| | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight | Num- ber | Average weight |
| 18 | | | | | | | | |
| 23 | | | | | | | | |
| 28 | | | | | | | | |
| 33 | | | | | | | | |
| 38 | | | | | | | | |
| 43 | | | | | | | | |
| 48 | | | | | | | | |
| 53 | 1 | 2.00 | | | | | | |
| 58 | | | 1 | 2.00 | | | | |
| 63 | | | | | | | | |
| 68 | 1 | 2.00 | | | | | | |
| 73 | 1 | 3.00 | 2 | 3.50 | | | | |
| 78 | 1 | 3.00 | | | 2 | 4.00 | 1 | 4.00 |
| 83 | 2 | 4.00 | 1 | 4.00 | 6 | 4.83 | 7 | 4.43 |
| 88 | 4 | 5.25 | 6 | 4.67 | 5 | 4.80 | 15 | 5.00 |
| 93 | 9 | 6.11 | 9 | 6.33 | 22 | 6.23 | 25 | 5.72 |
| 98 | 28 | 6.96 | 20 | 7.15 | 26 | 7.08 | 27 | 6.81 |
| 103 | 33 | 8.06 | 36 | 8.06 | 37 | 8.03 | 44 | 8.11 |
| 108 | 43 | 9.23 | 45 | 9.16 | 55 | 9.27 | 49 | 8.98 |
| 113 | 59 | 10.76 | 71 | 10.61 | 58 | 10.47 | 62 | 10.56 |
| 118 | 55 | 12.00 | 74 | 12.14 | 51 | 12.10 | 57 | 12.07 |
| 123 | 48 | 13.98 | 62 | 13.58 | 47 | 13.66 | 61 | 13.57 |
| 128 | 53 | 15.83 | 67 | 15.63 | 43 | 15.56 | 49 | 15.92 |
| 133 | 50 | 17.72 | 66 | 17.53 | 51 | 17.71 | 61 | 17.44 |
| 138 | 57 | 19.65 | 73 | 19.52 | 77 | 19.61 | 61 | 19.77 |
| 143 | 39 | 22.13 | 57 | 22.18 | 58 | 22.21 | 68 | 22.12 |
| 148 | 29 | 24.38 | 38 | 25.21 | 90 | 25.13 | 81 | 24.74 |
| 153 | 15 | 27.53 | 39 | 27.90 | 64 | 28.20 | 43 | 28.05 |
| 158 | 17 | 30.94 | 18 | 31.67 | 59 | 30.93 | 42 | 30.36 |
| 163 | 10 | 34.00 | 15 | 35.13 | 22 | 33.77 | 25 | 33.96 |
| 168 | 4 | 37.25 | 24 | 38.79 | 13 | 39.23 | 12 | 38.58 |
| 173 | | | 8 | 42.88 | 3 | 42.67 | 7 | 43.57 |
| 178 | | | 5 | 45.40 | 1 | 48.00 | 3 | 50.67 |
| 183 | | | | | | | 1 | 52.00 |
| 188 | | | | | | | | |
| 193 | | | 1 | 62.00 | | | 1 | 62.00 |
| Total | 559 | | 738 | | 790 | | 802 | |

Table 2.--Length-weight distributions for mature and immature Texas shrimp for July and August, both sexes included, weights in grams

| Midpoint of length interval (mm.) | Immature | | | Mature | | |
|---|-------------|-----------------|-------------------|-------------|-----------------|-------------------|
| | Num- ber | Total weight | Average weight | Num- ber | Total weight | Average weight |
| 18 | 8 | 0.8 | 0.10 | | | |
| 23 | 15 | 1.5 | 0.10 | | | |
| 28 | 20 | 3.5 | 0.18 | | | |
| 33 | 23 | 7.6 | 0.33 | | | |
| 38 | 27 | 13.5 | 0.60 | | | |
| 43 | 15 | 10.5 | 0.70 | | | |
| 48 | 26 | 22.9 | 0.88 | | | |
| 53 | 22 | 27.2 | 1.24 | | | |
| 58 | 13 | 21.5 | 1.65 | | | |
| 63 | 5 | 9.9 | 1.98 | | | |
| 68 | 6 | 15.0 | 2.50 | | | |
| 73 | 3 | 9.0 | 3.00 | | | |
| 78 | 12 | 46.4 | 3.87 | | | |
| 83 | 11 | 51.4 | 4.67 | | | |
| 88 | 11 | 58.3 | 5.30 | | | |
| 93 | 23 | 140.0 | 6.09 | | | |
| 98 | 35 | 253.0 | 7.23 | | | |
| 103 | 65 | 529.0 | 8.14 | | | |
| 108 | 56 | 509.0 | 9.09 | | | |
| 113 | 81 | 873.0 | 10.78 | | | |
| 118 | 89 | 1093.0 | 12.28 | | | |
| 123 | 107 | 1467.0 | 13.71 | | | |
| 128 | 135 | 2110.0 | 15.63 | | | |
| 133 | 141 | 2505.0 | 17.77 | | | |
| 138 | 194 | 3814.0 | 19.66 | | | |
| 143 | 145 | 3223.0 | 22.23 | | | |
| 148 | 92 | 2307.0 | 25.08 | 7 | 186.0 | 26.57 |
| 153 | 69 | 1890.0 | 27.39 | 42 | 1292.0 | 30.76 |
| 158 | 20 | 624.0 | 31.20 | 164 | 5632.0 | 34.34 |
| 163 | 14 | 484.0 | 34.57 | 266 | 9967.0 | 37.47 |
| 168 | | | | 221 | 9028.0 | 40.85 |
| 173 | | | | 151 | 6756.0 | 44.74 |
| 178 | | | | 94 | 4572.0 | 48.64 |
| 183 | | | | 46 | 2435.0 | 52.93 |
| 188 | | | | 19 | 1080.0 | 56.84 |
| 193 | | | | 3 | 180.0 | 60.00 |
| 198 | | | | 2 | 140.0 | 70.00 |
| Total | 1483 | | | 1015 | | |

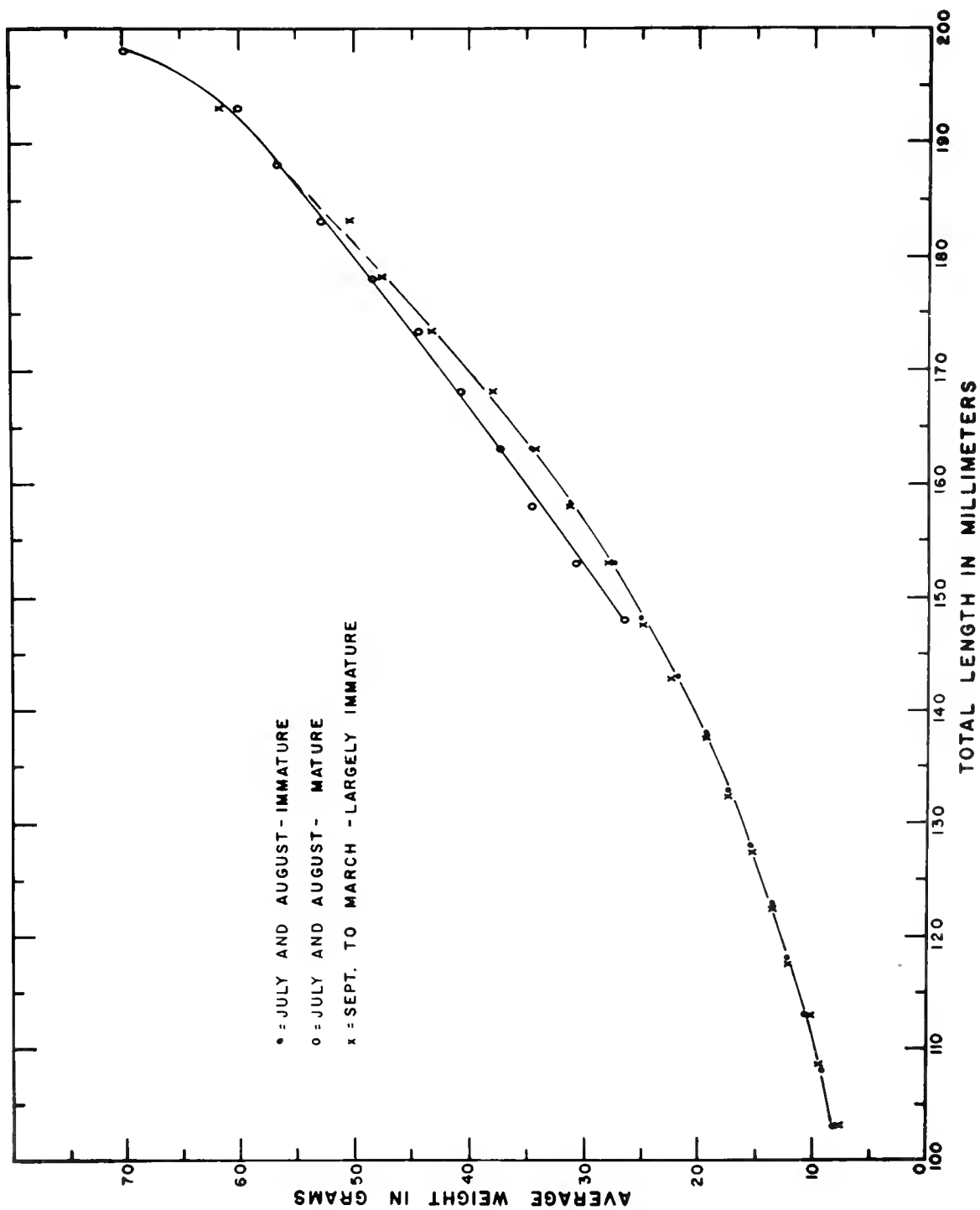


Figure 1.--Comparison of the length-weight relation between mature and immature specimens.

Table 3.--Length-weight distribution for
Texas shrimp (103 mm. and larger)
for September to March inclusive,
both sexes included

| Midpoint of length interval (mm.) | Num- ber | Total weight in grams | Average weight in grams |
|---|-------------|--------------------------------|----------------------------------|
| 103 | 285 | 2,264 | 7.94 |
| 108 | 395 | 3,603 | 9.12 |
| 113 | 548 | 5,827 | 10.63 |
| 118 | 573 | 6,938 | 12.11 |
| 123 | 679 | 9,417 | 13.87 |
| 128 | 738 | 11,688 | 15.84 |
| 133 | 799 | 14,178 | 17.74 |
| 138 | 807 | 15,939 | 19.75 |
| 143 | 661 | 14,722 | 22.27 |
| 148 | 599 | 15,015 | 25.07 |
| 153 | 385 | 10,787 | 28.02 |
| 158 | 344 | 10,779 | 31.33 |
| 163 | 202 | 6,978 | 34.54 |
| 168 | 158 | 6,054 | 38.32 |
| 173 | 54 | 2,329 | 43.13 |
| 178 | 29 | 1,390 | 47.93 |
| 183 | 10 | 502 | 50.20 |
| 188 | 1 | 50 | 50.00 |
| 193 | 2 | 124 | 62.00 |
| <hr/> | | | |
| Total | 7269 | | |

Table 4.--Length-weight distribution for Texas shrimp, sexes combined and data for all months included. (Approximate number of tails per pound was computed by applying the factor of 1.68 to the number of shrimp per pound)

| Midpoint of length interval (mm.) | Number | Total weight in grams | Average weight in grams | Number per pound | Approx. number tails per pound |
|---|--------|--------------------------------|----------------------------------|------------------------|--|
| 18 | 9 | 0.9 | 0.10 | 4535.9 | |
| 23 | 23 | 2.4 | 0.10 | 4535.9 | |
| 28 | 31 | 5.6 | 0.18 | 2519.9 | |
| 33 | 43 | 13.6 | 0.32 | 1417.5 | |
| 38 | 47 | 23.5 | 0.50 | 907.2 | |
| 43 | 19 | 13.2 | 0.69 | 657.4 | |
| 48 | 30 | 26.6 | 0.89 | 509.7 | |
| 53 | 28 | 34.1 | 1.22 | 371.8 | |
| 58 | 20 | 31.7 | 1.58 | 287.1 | |
| 63 | 6 | 11.9 | 1.98 | 229.1 | |
| 68 | 10 | 25.0 | 2.50 | 181.4 | |
| 73 | 12 | 41.0 | 3.42 | 132.6 | |
| 78 | 28 | 97.4 | 3.48 | 130.3 | |
| 83 | 45 | 196.4 | 4.36 | 104.0 | 174.7 |
| 88 | 68 | 341.3 | 5.02 | 90.4 | 151.9 |
| 93 | 136 | 813.0 | 5.98 | 75.9 | 127.5 |
| 98 | 205 | 1436.0 | 7.00 | 64.8 | 108.9 |
| 103 | 350 | 2793.0 | 7.98 | 56.8 | 95.4 |
| 108 | 453 | 4131.0 | 9.12 | 49.7 | 83.5 |
| 113 | 634 | 6756.0 | 10.66 | 42.6 | 71.6 |
| 118 | 679 | 8261.0 | 12.17 | 37.3 | 62.7 |
| 123 | 815 | 11328.0 | 13.90 | 32.6 | 54.8 |
| 128 | 965 | 15372.0 | 15.93 | 28.5 | 47.9 |
| 133 | 1107 | 19834.0 | 17.92 | 25.3 | 42.5 |
| 138 | 1261 | 25220.0 | 20.00 | 22.7 | 38.1 |
| 143 | 1084 | 24565.0 | 22.66 | 20.0 | 33.6 |
| 148 | 1089 | 28030.0 | 25.74 | 17.6 | 29.6 |
| 153 | 1059 | 30763.0 | 29.05 | 15.6 | 26.2 |
| 158 | 1190 | 38738.0 | 32.55 | 13.9 | 23.4 |
| 163 | 1031 | 37299.0 | 36.18 | 12.5 | 21.0 |
| 168 | 852 | 33694.0 | 39.55 | 11.5 | 19.3 |
| 173 | 531 | 23233.0 | 43.75 | 10.4 | 17.5 |
| 178 | 262 | 12586.0 | 48.04 | 9.4 | 15.8 |
| 183 | 117 | 6116.0 | 52.27 | 8.7 | 14.6 |
| 188 | 32 | 1819.0 | 56.84 | 8.0 | 13.4 |
| 193 | 10 | 604.0 | 60.40 | 7.5 | 12.6 |
| 198 | 3 | 210.0 | 70.00 | 6.5 | 10.9 |
| Total | 14284 | | | | |

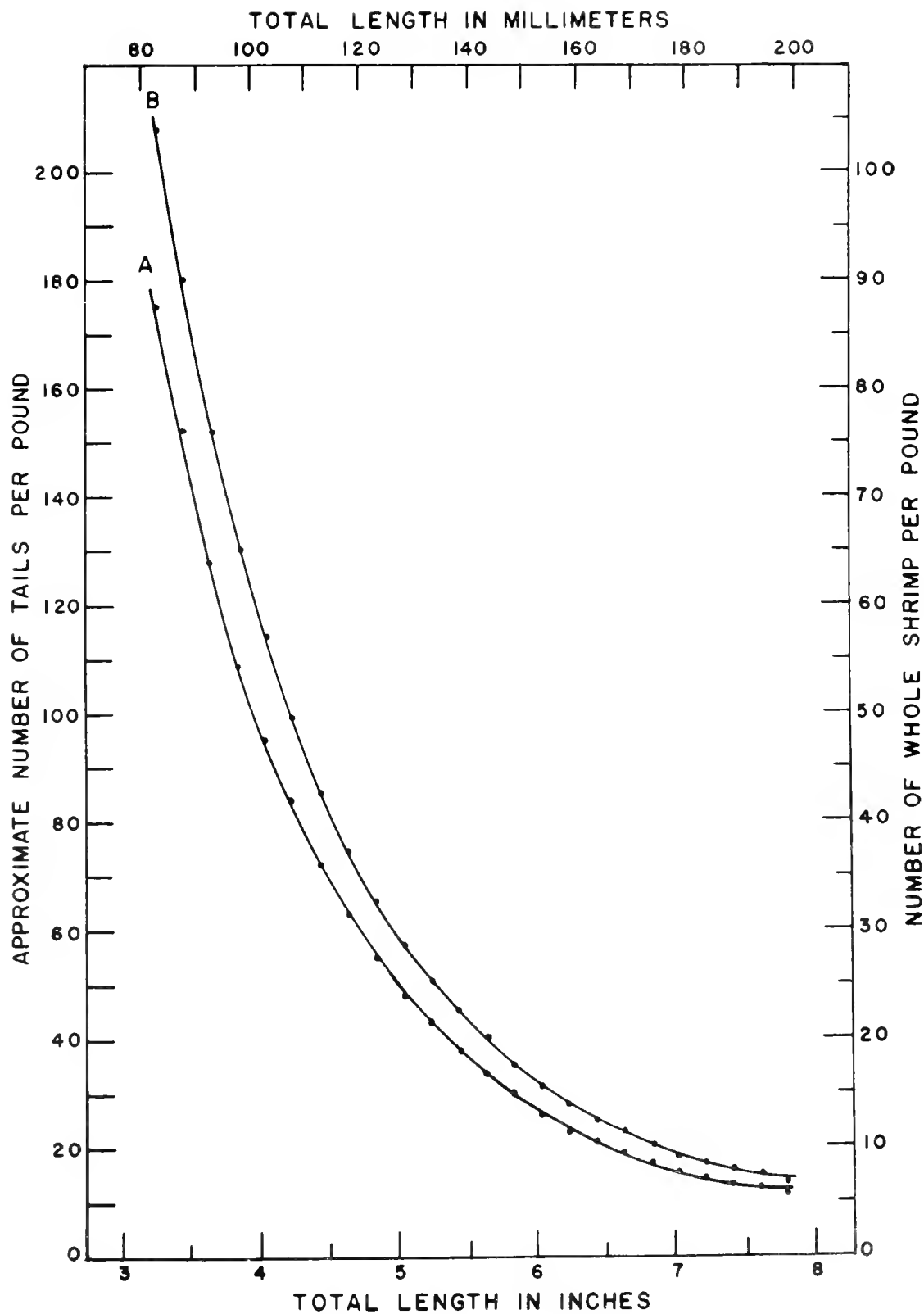


Figure 2.--Relation of the total length (in inches and millimeters) to number of whole shrimp (curve B) and approximate number of tails (curve A) per pound for shrimp about 3 to 8 inches long.

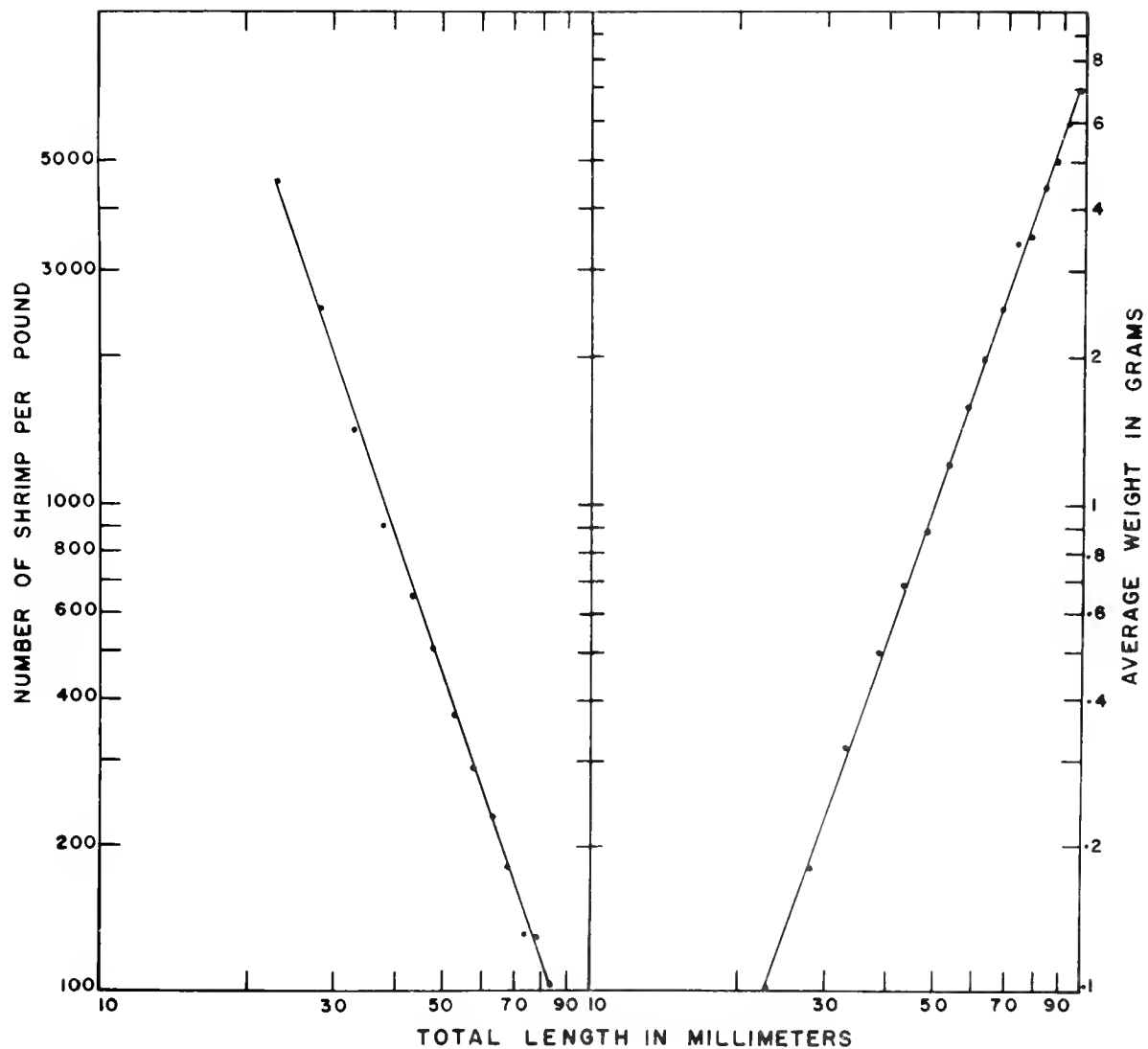


Figure 3.--Logarithmic relation of the total length in millimeters to number of shrimp per pound, and to weight in grams, for shrimp less than 100 mm. total length.



